SLEEPY J (PWS 7100197)
SOURCE WATER ASSESSMENT FINAL REPORT

July 1, 2004

State of Idaho
Department of Environmental Quality

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Executive Summary

Under the Federal Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the Act. The Idaho Department of Environmental Quality (DEQ) is completing the assessments for all Idaho public drinking water systems. The assessment for the Sleepy J drinking water source is based on a land use inventory within a 1,000-foot radius of the well source, sensitivity factors associated with the source, and characteristics associated with either your aquifer or watershed in which you live.

This report, Source Water Assessment for the Sleepy J (PWS # 7100197) describes the public drinking water system, the associated potential contaminant sources located within a 1,000-foot boundary around the drinking water source, and the susceptibility that may be associated with any associated potential contaminants. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this system. **The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the Sleepy J water system.**

The Sleepy J is located near the junction of Highway 26 and Highway 31 in Swan Valley, Idaho, in Bonneville County (see Figure 1). The non-community transient water system has one well that serves about 25 people through one (1) connection. The system has operated in its current configuration since July 3, 2002. Water quality tests conducted for the well do not show detections of total coliform bacteria from July 2002 through January 2004. However, there have been detections of nitrate within the sampled well water, though the levels are well below the above maximum contaminant level (MCL) of 10 milligrams per liter (mg/L) as set by the EPA.

Final susceptibility scores are derived from equally weighting system construction scores, hydrologic sensitivity scores, and potential contaminant/land use scores. Therefore, a low rating in one or two categories coupled with a higher rating in other categories results in a final rating of low, moderate, or high susceptibility. With the potential contaminants associated with most urban and heavily agricultural areas, the best score a well can get is moderate. Potential contaminants are divided into four categories, inorganic contaminants (IOCs, e.g. nitrates, arsenic), volatile organic contaminants (VOCs, e.g. petroleum products), synthetic organic contaminants (SOCs, e.g. pesticides), and microbial contaminants (e.g. bacteria). As different wells can be subject to various contamination settings, separate scores are given for each type of contaminant.

The final susceptibility ranking for the well is moderate for IOCs, VOCs, SOCs, and microbial contamination. A copy of the susceptibility analysis for the Sleepy J well along with a map showing potential contaminant sources are included with this summary. Information regarding the potential contaminants within the 1,000-foot boundary have been summarized and included in Table 1.

FIGURE 1. Geographic Location of Sleepy J

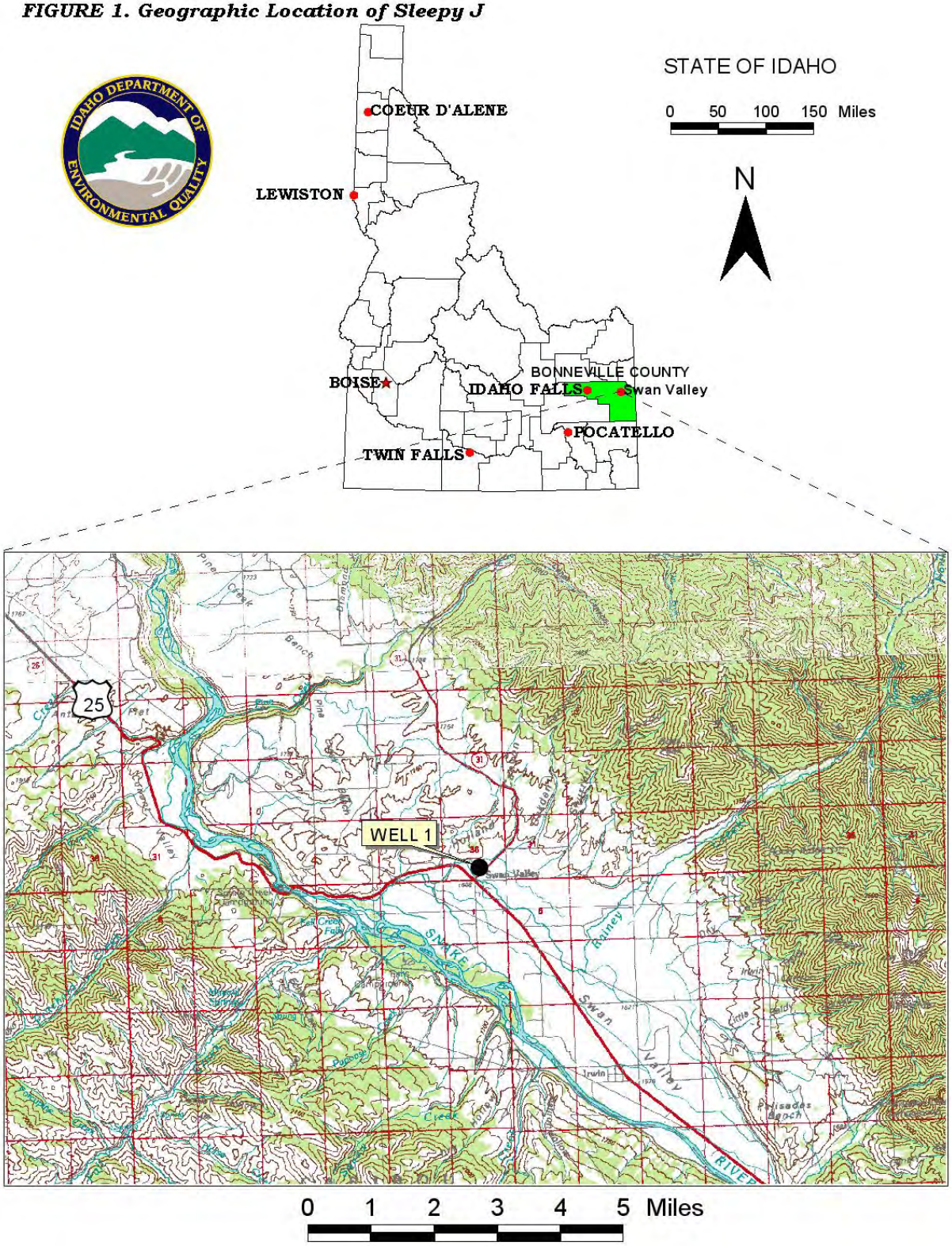
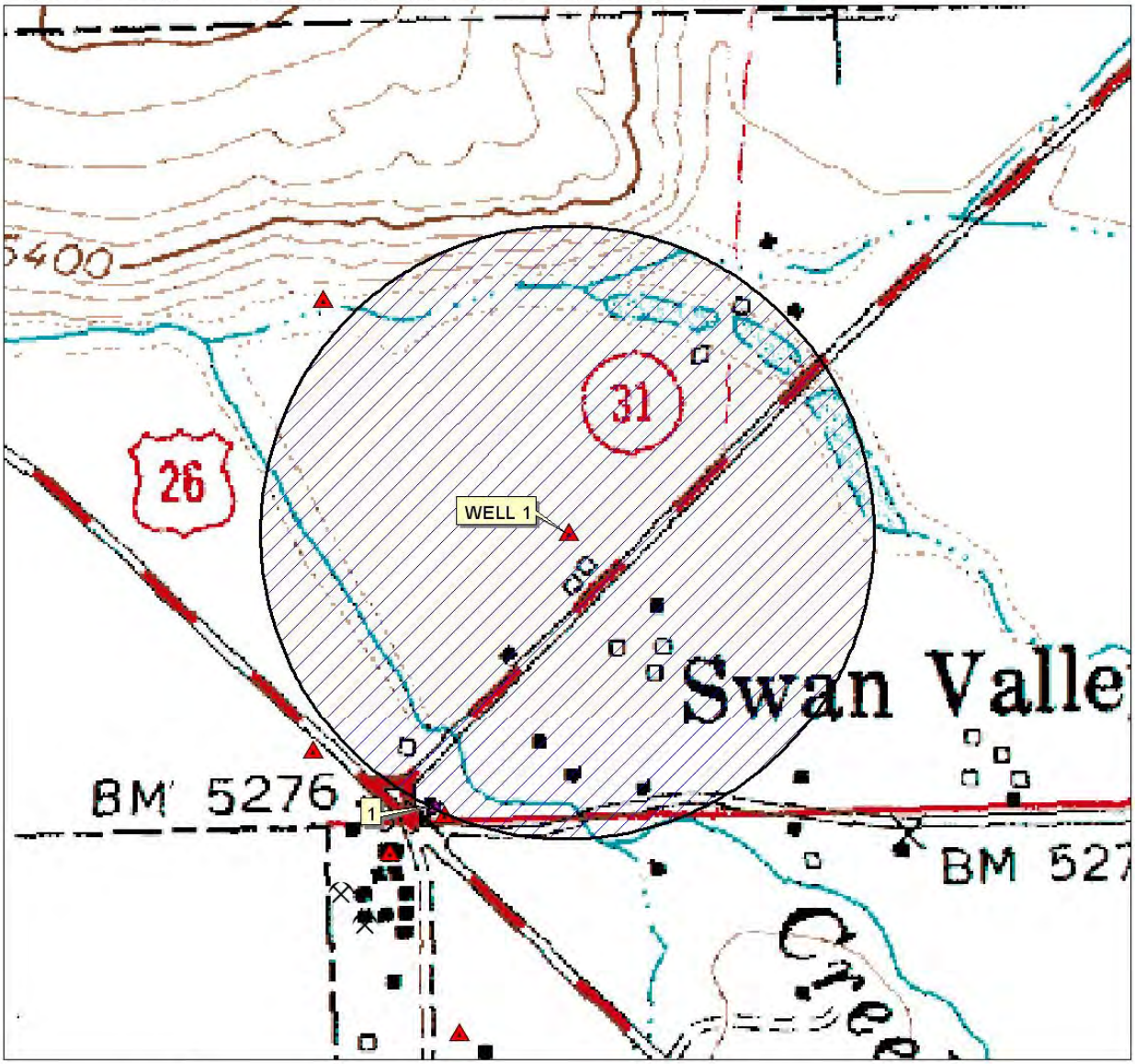


Figure 2. Sleepy J Delineation Map and Potential Contaminant Source Locations



Potential Contamination

The potential contaminant sources identified within the delineated area include Highway 31 and a gas station (see Table 1 and Figure 2). If an accidental spill occurred on Highway 31 or at the junction of Highway 26, then IOCs (e.g. nitrate), VOCs (e.g. petroleum products), SOCs (e.g. pesticides), and microbial contaminants (e.g. bacteria) could be added to the ground water. In additional, agricultural land uses within the delineation area add IOC and SOC chemical constituents to the ground water.

Table 1. Sleepy J Potential Contaminant Inventory

Map ID	Source Description	Source of Information	Potential Contaminants[1]
1	UST[2] site – open	Database Search	VOC, SOC
	Highway 31	GIS Map	IOC, VOC, SOC, M

[1]IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical, M= microbial
[2] UST = underground storage tank

Susceptibility Analysis

The water system's susceptibility to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity of the well, land use characteristics, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. Appendix A contains the susceptibility analysis worksheet. The following summaries describe the rationale for the susceptibility ranking.

The hydrologic sensitivity was rated high for the well. This rating is based upon multiple factors. The soils rate as moderate- to well-drained as defined by the Natural Resource Conservation Service. The well log describes the vadose zone as being composed of gravel and cobblestones until the water table was reached at 5 feet 11 inches below ground surface (bgs). There are no low permeability units identified in the well log to reduce the downward flux of contaminants. To reduce the hydrologic sensitivity score, the SWA Plan (DEQ, 1999) identifies deep ground water, at greater than or equal to 300 feet bgs, as a contributing factor. That is not the case for this well.

The well system's construction score was rated moderate. The well was drilled in May of 2002 to a depth of 110 feet bgs. The static water level at the time of drilling was 5 feet 11 inches bgs. The original Plans & Specifications approved by the DEQ for Sleepy J LLC showed a casing depth around 100 feet using a 6-inch diameter casing with a minimum gauge of .25 inches. The well driller's report indicates the well was constructed using a 0.250-inch thick, 8-inch diameter casing from 2 feet above the ground surface to 51 feet bgs into firm black lava, which is considered a confining layer as required by DEQ (1999) to achieve a lower score. The Idaho Department of Water Resources *Well Construction Standards Rules* (1993) require all PWSs to

follow DEQ standards as well. Table 1 of the *Recommended Standards for Water Works* (1997) lists the required steel casing thickness for various diameter wells. Six-inch diameter wells require a casing thickness of at least 0.288-inches and eight-inch diameter wells require a casing thickness of 0.322-inches. For the Sleepy J Well, the well driller did not follow the engineering plans. Although the casing depth is shallower than what was proposed and the casing thickness is less than what is required, the most important aspect of the well is the 51 feet of neat cement annular seal. The well construction is more than adequate for the intents and purposes that the Sleepy J Well was designed for and therefore is approved. According to the 2002 sanitary survey the sanitary seal is in good condition and it is protected from surface flooding.

The Sleepy J Well rated moderate (Table 2) for potential contaminant sources and land use for IOCs (e.g., nitrates), VOCs (e.g., petroleum products), SOCs (e.g. pesticides), and microbial contamination (e.g., total coliform). Highway 31 added to the rankings all types of contamination. In addition, the land use survey identified that agricultural land predominated the area and the county level use of nitrogen fertilizer and herbicides rated high.

The final susceptibility ranking for the well is moderate for all types of contaminants (see Table 2). Sources within 50 feet of the wellhead can give an automatic high score for the type of contaminant in question. A copy of the susceptibility analysis for the Sleepy J well along with a map showing potential contaminant sources are included with this summary. Information regarding the potential contaminants within the 1,000-foot boundary have been summarized and included in Table 1.

Table 2. Summary of Sleepy J Stores Susceptibility Evaluation

	Susceptibility Scores[1]									
	Hydrologic Sensitivity	Contaminant Inventory[2]				System Construction	**Final Susceptibility Ranking**			
		IOC	VOC	SOC	Microbial		IOC	VOC	SOC	Microbial
Well	H	M	M	M	M	M	M	M	M	M

[1]H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility
[2]IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical, M= microbial

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources. If the system should need to expand in the future, new well sites should be located in areas with as few potential sources of contamination as possible, and the site should be reserved and protected for this specific use.

Protection Activities

For the Sleepy J water system, drinking water protection activities should focus on maintaining the requirements of the sanitary survey. Protecting the well from unauthorized access would be an appropriate first step. The water system operator may consider installing a locking fence

around the wellhead to restrict direct access. No chemicals should be stored or applied within 50 feet of the well. Any releases on the highway within the delineation boundary should be evaluated and the drinking water should be evaluated following such a release. Working with the local soil and conservation district and Bonneville County will better inform the water system operator of chemicals that may be applied or stored near the drinking water well. The water system operator is also encouraged to develop a drinking water protection plan to document and rank potential contaminant sources, assess protection efforts, and provide education for staff and the public about the drinking water.

Partnerships with state and local agencies and industry groups should be established and are critical to success. Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. Drinking water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission, the local Soil Conservation District, and the Natural Resources Conservation Service.

Assistance

A water system must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact Jack Rainey in the Idaho Department of Environmental Quality Idaho Falls Regional Office at (208) 528-2650.

Water suppliers serving fewer than 10,000 persons may contact Ms. Melinda Harper, Idaho Rural Water Association, at 208-343-7001 (mlharper@idahoruralwater.com) for assistance with drinking water protection (formerly wellhead protection) strategies.

POTENTIAL CONTAMINANT INVENTORY LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

Business Mailing List – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLIS – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as Superfund is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few heads to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of storm water runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (IDEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100-year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.)

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25% of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RCRIS – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by IDEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory

References Cited

Idaho Department of Environmental Quality, 2002. State of Idaho Public Water System Sanitary Survey, Sleepy J Cabins.

Idaho Department of Environmental Quality, 1999. Source Water Assessment Plan.

Idaho Department of Environmental Quality, 1997. Design Standards for Public Drinking Water Systems. IDAPA 58.01.08.550.01.

Idaho Department of Water Resources, 1993. Administrative Rules of the Idaho Water Resource Board: Well Construction Standards Rules. IDAPA 37.03.09.

The final scores for the **Sleepy J** susceptibility analysis were determined using the following formulas:

1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.27)

2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.375)

Final Susceptibility Scoring:

0 - 5 Low Susceptibility

6 - 12 Moderate Susceptibility

> 13 High Susceptibility

SLEEPY J Well# : WELL 1

Public Water System Number 7100197 05/19/2004 11:00:16 AM

1. System Construction		SCORE
Drill Date	May 4, 2002	
Driller Log Available	YES	
Sanitary Survey (if yes, indicate date of last survey)	YES	2002
Well meets IDWR construction standards	NO	1
Wellhead and surface seal maintained	YES	0
Casing and annular seal extend to low permeability unit	YES	0
Highest production 100 feet below static water level	YES	0
Well located outside the 100 year flood plain and protected from surface flooding	YES	0
Total System Construction Score		1

2. Hydrologic Sensitivity		
Soils are poorly to moderately drained	NO	2
Vadose zone composed of gravel, fractured rock or unknown	YES	1
Depth to first water > 300 feet	NO	1
Aquitard present with > 50 feet cumulative thickness	NO	2
Total Hydrologic Score		6

3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	IRRIGATED AGRICULTUE	2	2	2	2
Farm chemical use high	YES	2	0	2	
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A		4	2	4	2

Potential Contaminant / Land Use - ZONE 1B					
Contaminant sources present (Number of Sources)	YES	2	2	2	2
(Score = # Sources X 2) 8 Points Maximum		4	4	4	4
Sources of Class II or III leacheable contaminants or	YES	6	2	2	
4 Points Maximum		4	2	2	
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0
Land use Zone 1B	Greater Than 50% Irrigated Agricultural Land	4	4	4	4
Total Potential Contaminant Source / Land Use Score - Zone 1B		12	10	10	8
Cumulative Potential Contaminant / Land Use Score		16	12	14	10
Weighted Potential Contaminant / Land Use Score		4	3	4	4
4. Final Susceptibility Source Score		12	11	12	12
5. Final Well Ranking		Moderate	Moderate	Moderate	Moderate